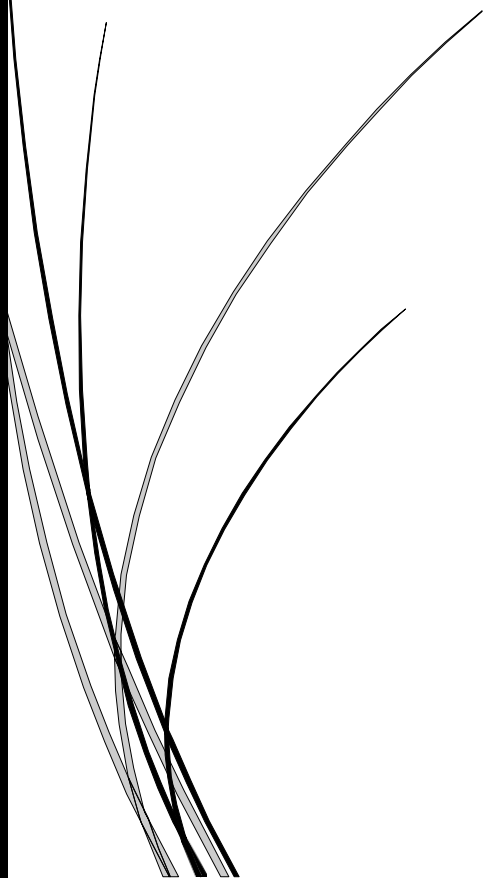
Quality In, Quality Out: Improving the SC Student Information System Training Program



J. Wyatt Cothran

Data Collection Team Leader – Office of Research and Data Analysis

SOUTH CAROLINA DEPARTMENT OF EDUCATION

02/03/20

TABLE OF CONTENTS

INTRODUCTION

The mission and vision of the South Carolina Department of Education (SCDE) center on providing leadership and support so that all students graduate prepared for success in college, careers, and citizenship. As a multifaceted agency, achieving this mission is accomplished via multiple divisions engaged with various priorities and focus areas. The Office of Research and Data Analysis (ORDA), for example, conducts activities around the priority of enhancing the infrastructures, resources, data, and technology of the SC public education system. A specific focus area for delivering on this priority is data-driven decision making with respect to policies, procedures, and a strong system of supports to school districts. Drilling down further, a ~~particular~~ ORDA work process in support of this focus area is end-user training for the application schools use to record and operationalize student information, otherwise known as the Student Information System (SIS). The goal of this project is to improve this ~~particular~~ work process so that schools can more confidently rely on SIS data to inform student-centered decisions and, therefore, enhance the ability of the SC public education system to graduate students prepared for success.

BACKGROUND

The SIS is procured by ORDA from a national vendor who provides both a core product that is capable of maintaining the most essential student information data points and a customized platform that is necessary to enter additional information SCDE is responsible for reporting to state and federal stakeholders. For example, SIS data from the customized platform are used in setting SC school funding levels, calculating school's state and federal accountability ratings, and allocation decisions around state/federal supports for underperforming schools. The quality

of data entered into the SIS, therefore, directly affects the quality of decisions made by consumers of those data. These decisions, in turn, affect the quality of the SC public education system. Garbage in, garbage out; or, better yet: quality in, quality out.

In effort to improve the quality of SIS data, the ORDA develops and executes a training series for school data coordinators[1] covering data entry expectations for the customized platform. As the reporting requirements of state and federal stakeholders are subject to frequent change, the data entry expectations for the customized platform are also frequently adjusted. Therefore, the training materials ORDA develops for this platform must be adjusted in concert. Improving the process around maintaining consistency of end-user training materials with the dynamic nature of the SIS is a method by which ORDA can meaningfully impact the quality of SIS data.

PROBLEM STATEMENT

Currently, the SIS training program is focused rather narrowly. Specifically, it is a one-time event for participants with minimal follow-up around changes to the training content afterwards. This presents a risk to program effectiveness and long-term success. Given this narrow focus, a multi-phase approach of process improvement is recommended to promote training robustness and repeatability.

The goal of the first phase is to standardize the training material update process. This is necessary because, as noted earlier, the SIS is frequently updated to accommodate changing data reporting requirements. These updates affect the data entry expectations detailed in the training

[1] School data coordinators are the school-level personnel responsible for entering student data into the SIS and ensuring its quality.

modules. Failure to align training content with SIS updates reduces training quality and negatively affects the department's ability to achieve agency objectives. Currently, the alignment method is largely unstructured. Therefore, the first recommendation is to standardize the schedule for training material updates to ensure alignment of content with SIS updates.

The second phase of improvement is designed to ensure previous participants have access to training content updates as they become available. A process for this purpose does not currently exist. This presents a risk to SIS data quality if data entry expectations change after participants complete the training and are not notified of the adjusted expectations. Therefore, developing a standard procedure for providing content updates to previous training participants is critical for maintaining the integrity of the SIS training program.

The goal of the third phase is to convert the SIS training program to a virtual course where participants can earn a recognized micro-credential for demonstrating content mastery. Doing so will allow for a more effective and consistent method of training delivery, and for participants to signal competency to current and future employers. This phase requires converting training content to a virtual course, creating an assessment protocol, and integrating both into a learning management system with appropriate digital badging. As a side benefit, this phase will allow for valuable feedback on existing training content and the ability to recommend remediation materials to participants.

Measuring training program outcomes should be possible after the SIS training program has stabilized[2]. This represents the fourth phase of the recommended process improvement. The overriding goal of this phase is to determine if past participants are more reliable, more responsible, and/or more credible (e.g., can they solve problems and answer questions efficiently/effectively) as a result of the training. This will provide valuable feedback to guide training content development/redevelopment decisions for the department.

DATA COLLECTION

To measure performance of this multi-phase approach to process improvement, data for the following metrics are collected, reviewed, and analyzed.

The first phase of enhancement involves standardizing the schedule for training content updates. An update procedure is now structured for this process (Appendix A). The procedure sets a performance goal for the amount of time required for each training material update. The number of business days between a SIS change release from the vendor and updated training content finalization is expected to be ten or fewer. Several associated metrics are designed to promote adherence to this schedule and measure performance:

1. Cycle time is calculated by measuring the number of days between the SIS change and training materials update. Data points are entered into an MS Access Database that includes tables for each training section. The database contains fields to capture both PLANNED and ACTUAL dates for the following areas: content update responsibilities assigned, date of training content update, date of team sign-off on the training content

[2] Note the SIS Training Program was designed and initially executed in 2019.

update, and date of updated training content release. Having fields for both PLANNED and ACTUAL dates allows for more granular analysis of variation in cycle time. That is, this allows the ability to determine the point(s) in the update process responsible for variation. The date of SIS update is the day a change to the customized SIS platform is confirmed via notice from the vendor. The date of finalized training content update is the day on which the training material content owner signs off on a successful update. The number of days between these two points is the calculated cycle time. Measuring variation in cycle time from the ten-day goal provides performance information.

2. Defects are captured in a maintenance log detailing unplanned training content updates due to inaccuracies or previous omissions. These data will provide performance information around the completeness of each content update and identify areas in need of increased scrutiny or added attention.

The second phase of process improvement involves ensuring training program participants have access to updated training materials. Cycle time is measured as the length of time between updated content release to participant notification of access to the updated content. Cycle time data are compared against a baseline expectation of ten (10) business days for successful completion. The data source for this metric is a MS Access Database that includes a record for each update with data points for the date of content update and the date of participant notification. This metric provides performance information for this phase and promotes adherence to an update schedule.

Plans for the third and fourth phases of this process improvement are not finalized, however a sketch of potential data sources follows. As the third phase involves assessing virtual course participants for content mastery, various output metrics should provide feedback around training quality for continuous improvement purposes. At a minimum, these will include~~:~~ the number of attempts, number of completions, percent completion, and assessments to gauge percentage of each content standard mastered. The fourth phase centers around measuring effectiveness of the training program. As such, it requires clearly defined and measurable metrics and standard procedure for measuring and reporting data generated by those metrics.

IMPLEMENTATION PLAN

The multi-phase approach to process improvement requires several elements for successful implementation. The timeframes outlined in the training content update procedure for the first phase should be agreed upon by all personnel involved in completing the necessary work. As noted in Appendix A, each update involves multiple steps with a specified length of available time. Additionally, each update could touch one or more content areas, and therefore more than one person could be responsible for completing the work. A consensus decision making rule should be employed to approve the procedure, as complete buy-in is necessary for effective implementation of a process requiring input from many people. Otherwise, implementation may suffer from lack of motivation to be timely.

The second phase of implementation requires developing a procedure that outlines the processes involved in making each content update available to past training participants. There are likely more efficient methods of delivering the updates than the current process (participants notified

via email of updated content available for download from a SFTP site) which should be explored in the future. However, the training content is not currently in an assessable format and, therefore, cannot be hosted in an online forum. For reasons consistent with those noted above, it is recommended a consensus decision making rule be adopted around the procedure and the delivery mechanism. Additionally, it is recommended the procedure detail the steps involved in maintaining communication with previous training participants, as this could prevent previous participants from becoming unaware of revised data entry expectations.

Action steps towards implementing the third phase include: developing a plan for converting the training materials to assessable online content with voice recordings, planning delivery of the applied training exercises in a virtual environment, designing an assessment framework for participants, and executing the implementation plan. The need for additional software and/or technology required for implementation of this phase should be assessed, as well as the existing department skill set available for executing this type of work. More implementation concerns will surely materialize as this phase moves forward.

Careful thought should be allocated to the fourth phase of process improvement, as it requires designing performance metrics around training program effectiveness. Simple output measures are relatively easy to design, however measuring outcomes that speak to program effectiveness require gathering data from and about the quality of work training participants are able to execute later in their professional career. Measurements of work quality likely require a baseline or reference case for comparison to determine participants' relative reliability, responsibility, and credibility (i.e., the work they produce is better or worse than what/whom). Teasing out the

effects of training from skills learned on the job will likely be difficult. Measuring participants' perception of training outcomes (e.g., their feeling whether the training helped them perform relevant job functions) could overcome the challenge of gathering performance-based information. However, accompanying this path are yet another set of challenges, particularly around the involved subjectivity of self-assessment.

DATA ANALYSIS

It would be difficult to provide a valid critique of the first phase without additional data points, however, initial data suggest the procedure for this phase may be an area that requires reexamination in the future. Analysis of currently collected data reveal the performance target of ten business days for training content updates could be too restrictive. Appendix B illustrates data points from the first five update cycles since the update procedure was released. One update met the target cycle time; two were completed in fifteen business days; and one took twenty business days for completion. Of the various explanations for delays, notes for each update (Appendix C) reveal two were due, in part, to the application vendor failing to install the SIS update into SCDE's production environment in an expedited manner. This caused downstream delays in assessing the impact of each update on training content and with capturing screenshots of application changes for updated content. The update that stretched twenty days was explained by personnel vacations planned around the Christmas and New Year's holidays. Additionally, the update procedure being a relatively new process could partially explain extended update cycles. Eventually, one would expect the process to become more familiar to personnel responsible for its implementation, and, therefore, its execution become more consistent and timely.

Data collected to provide performance information around content defects are inconclusive. A log of unplanned updates contains six entries (Appendix D), each of which note inaccurate or missing information found in the training materials *as initially developed*. No entries involved necessary corrections to the materials resulting from a content update after initial release to production. That is, no defects were identified with content updates – only with the original content. Therefore, at least at this point in time, data collected on defects do not provide conclusive performance information around the update process.

There are not sufficient data collected to inform performance of the second phase of process improvement. The goal of an established procedure around providing updated training materials to previous participants is not yet realized. Therefore, although the framework for collection of cycle time for this procedure exists, no data points are included. More on this below. Similarly, as phases three and four are not yet fully realized, no data exist for analysis.

EVALUATION METHOD

The overarching goal of this process improvement is maintaining consistency of end-user training materials with the dynamic nature of the SIS. As such, success should be evaluated on the basis of how well the training materials are updated and made available for end users. The performance metrics established for measuring cycle time and product defects for the first two phases are designed for this purpose. Successful implementation should be evidenced by cycle times with minimal variation around baseline expectations and defects for each update at or near zero.

SUMMARY AND RECOMMENDATIONS

Phase one of this process improvement is fully implemented and its effectiveness under evaluation. Team consensus was achieved around the update procedure, however, the first six months have revealed potential issues around its practicality as evidenced by wide variation in update cycle times. Several explanatory reasons for these variations are summarized below with accompanying recommendations for remediation.

- One explanatory reason for larger than expected cycle time variation involves the SIS vendor not providing timely updates to the SCDE production environment. It is recommended this roadblock be remedied via service level agreements with the vendor.
- Another potential reason for the above-expected cycle times relates to the friction involved in executing new procedures. The implementation team may settle into a more stable update cycle after more experience is gained. Therefore, it is recommended to wait and see before addressing initially apparent work deficiencies.
- An unexpected difficulty experienced in the first six months involves distributing the actual work required for each content update. The initial approach was to evaluate each SIS update for its impact on each content module, with the expectation that the personnel who developed affected modules will perform the necessary updates. Personnel absences (planned and unplanned) caused friction in this approach. It is recommended to evaluate alternative methods for assigning update duties. If an alternative method is adopted, it should only be done so with team consensus and then added to the update procedure.
- A recommendation to reduce variation in cycle time is bringing added attention to the metric. The goal of this approach is making those responsible for updates more cognizant

of delivery expectations and variation resulting from update delays. This type of added attention could be achieved through dashboard reports that compare expected to actual delivery dates (i.e., cycle time). These reports could be delivered to personnel at various intervals to encourage visibility and attention to timelines.

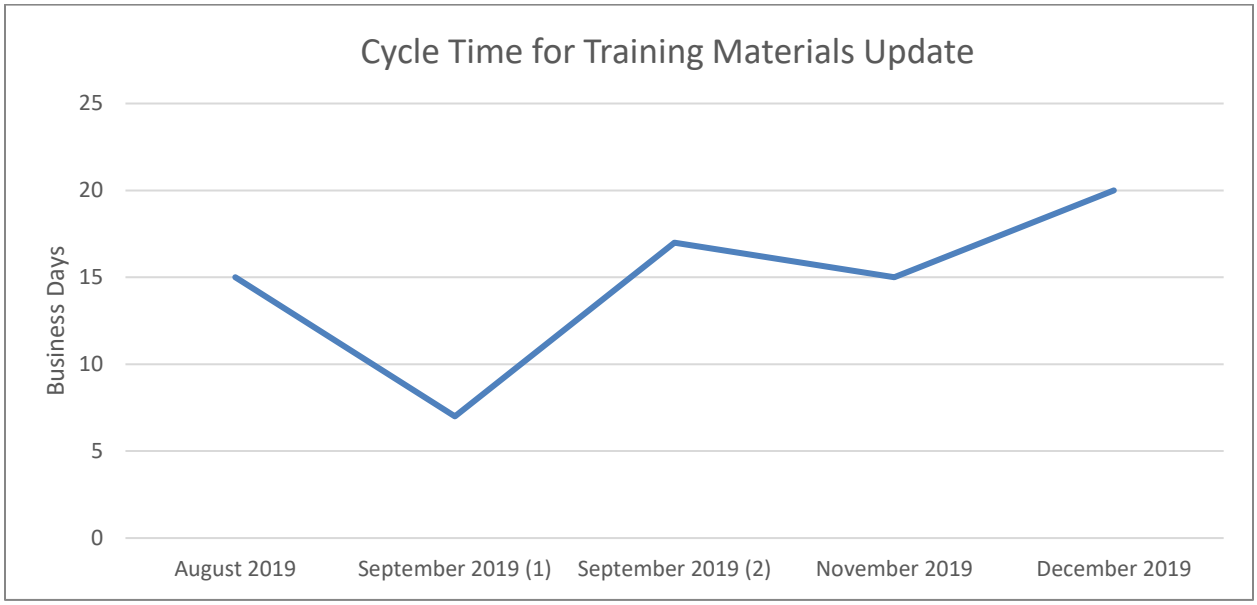
After implementing some or all of these recommendations, gathering performance data from the established metrics should provide feedback around their effectiveness in reducing cycle time variation. Only then should the procedure establishing the ten-day performance goal be revisited.

Appendix A

Procedure for "Student Information System Training Program" Updates:

1. Request for SIS change initiated
2. Request approved
3. SIS change released by SIS vendor – as confirmed by ORDA personnel (business day 1)
4. Review of released changes for impact on training materials. Responsibilities for updating training materials assigned to team member(s), if necessary (business day 3)
5. Training materials updated (business day 6)
6. At least two team members sign off on successful update. Content shared with team. (business day 8)
7. Versioning, including explanation of changes
8. Archival of previous version
9. Deadline for team feedback on updated content (business day 10)
10. Updated content finalized and data points entered into performance metric database (business day 10)

Appendix B


Cycle Time for Training Materials Update
Business Days
25
20
15
10
5
0
August 2019
September 2019 (1)
September 2019 (2)
November 2019
December 2019

Appendix C: Notes from content updates

Version Number	Notes
August 2019	none
September 2019 (1)	none
September 2019 (2)	delayed due to lack of installation of state release on the hosted server. Jones had to call PS support to make this happen. Wc
November 2019	Wyatt asked if anyone had reviewed the changes he made on 12/9. Josh responded on 12/10 that he had.
December 2019	Christmas and new years holidays. Issue having hosted server updated so team could capture screenshots.
January 2020	no changes necessary this month.

Appendix D: Defect log

Date	What was the change and why was it necessary?
9/3/2019	The 3-Unit Completer field on the CTE page is now only visible for certain CIP codes. Josh investigating when the change was introduced and how we missed it. Wc
9/12/2019	The ESOL slides refer to appendix E in specific fields manual that no longer exist.
9/12/2019	On the EFA/EIA page where it lists the different tabs, somehow the High Achieving tabs were left off that list.
9/12/2019	On the contacts page, below the contacts grid we somehow missed covering the medical alert, emergency alert and the alert end date and comments. Guarding alert is covered but there are also more further down the page we missed.
9/12/2019	On Student Info page, we did not include the LEP initial test box on the right side of the page in the top section.
11/12/2019	AOWs for EL funding were not communicated correctly in the initial slide deck. We needed to add CM, A1, A2, A3. Also, changed "1-5, 6.0" to "1.0-6.0".